



## DEPARTMENT OF COMMERCE

### International Trade Administration

#### Rice University, et. al; Application(s) for Duty-Free Entry of Scientific Instruments

Pursuant to Section 6(c) of the Educational, Scientific and Cultural Materials Importation Act of 1966 (Pub. L. 89-651, as amended by Pub. L. 106-36; 80 Stat. 897; 15 CFR part 301), we invite comments on the question of whether instruments of equivalent scientific value, for the purposes for which the instruments shown below are intended to be used, are being manufactured in the United States.

Comments must comply with 15 CFR 301.5(a)(3) and (4) of the regulations and be postmarked on or before **[INSERT DATE 20 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. Address written comments to Statutory Import Programs Staff, Room 3720, U.S. Department of Commerce, Washington, D.C. 20230. Please also e-mail a copy of those comments to [Dianne.Hanshaw@trade.gov](mailto:Dianne.Hanshaw@trade.gov).

Docket Number: 21-001. Applicant: Rice University, 6100 Main Street, Houston, TX 77005. Instrument: Light Crafter 4500 EVM. Manufacturer: Digi-Key Electronics, China. Intended Use: The LightCrafter 4500 will be used in an ongoing research study to develop a compact optical mapping scope that uses Digital Light Processing (DLP) technology to capture white light and auto-fluorescence images and actively project onto the oral mucosa a map highlighting areas at high risk for oral dysplasia and cancer, based on: loss of collagen fluorescence (a signal of invasion & metastasis) and alterations in epithelial NAD(P)H and FAD

fluorescence (a signal of de-regulated cellular energetics). With this device, we will design and assemble an optical system that allows for wide field imaging of the oral cavity, where the LightCrafter 4500 is aligned with the camera such that any area that can be imaged can also be projected upon. We will develop tracking algorithms to adjust the projected map as needed to ensure accurate positioning despite patient movement. The objective is to develop an optical imaging system that will detect high-risk areas of the oral mucosa and project high-risk maps onto the oral mucosa to guide clinicians on where to take a biopsy. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: June 9, 2020.

Docket Number: 21-002. Applicant: Drexel University, 3401 Market Street, Philadelphia, PA 19104. Instrument: Light Microscope with motorized stage, attached camera and image – capturing hardware and software. Manufacturer: Info in Images Ltd., United Kingdom. Intended Use: To develop a novel research tool for scientists studying microscopic algae and to facilitate access to the holdings of the Diatom Herbarium at the Academy of Natural Sciences of Drexel University, a non-profit public museum with a mission of research in environmental conservation and public education. This customized automated microscope side-scanning system will be used to create high-resolution images of microscopic organisms on permanent slides that could be viewed and studied online using a virtual microscopy application. Digital images of the slides, containing millions of individual specimens of microorganisms and representing snapshots of their assemblages, will be served online to support research programs focused on environmental change and its effects on aquatic biota. The applications based on images acquired with this slide-scanning system will be used to increase the efficiency of water quality and ecosystem health monitoring in rivers, lakes, and

coastal areas of the ocean. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States.

Application accepted by Commissioner of Customs: June 9, 2020.

Docket Number: 21-003. Applicant: UChicago Argonne LLC, Operator of Argonne National Laboratory, 9700 South Cass Avenue, Lemont, IL 60439-4873. Instrument: A:VC 19 Photon Extraction Vacuum Chambers. Manufacturer: Strumenti Scientific CINEL S.R.L., Italy. Intended Use: These components are required to complete the assembly of the Advanced Photon Source upgrade storage ring vacuum system. The APS-U storage ring vacuum system is approximately 1.1-km in circumference and will store the electron and photon beams in an ultra-high vacuum (UHV) environment. The materials/phenomena that are studied vary widely from material properties analysis, protein mapping for pharmaceutical companies, X-ray imaging and chemical composition determination, to name a few. These components will be used exclusively for scientific research for a minimum of 5 years at Argonne National Laboratory. The properties of the materials studied include but are not limited to grain structure, grain boundary and interstitial defects, and morphology. These properties are not only studied at ambient environments but also under high pressure, temperature, stress and strain. The objective is to further the understanding of different materials and material properties. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: April 26, 2021.

Docket Number: 21-004. Applicant: William Marsh Rice University, 6100 Main Street, Houston, TX 77005. Instrument: Angle-Resolved Photoemission Spectroscopy System. Manufacturer: Fermion Instruments, China. Intended Use: The technique of angle-

resolved photoemission spectroscopy is a very specialized technique used to directly image the electronic structure of synthesized single crystalline materials or thin film materials. This technique is mainly used to study fundamental physical and electrical properties of materials, how electrons interact with each other leading to the insulating, metallic, or superconducting properties of materials for fundamental research. The measurement of electronic structure will provide important information on the fundamental physical origin of why a material is a good conductor or insulator or a superconductor. This will be beneficial towards new physics theories about solid state materials for academic purposes. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: July 25, 2021.

Docket Number: 21-005. Applicant: UChicago Argonne LLC, Operator of Argonne National Laboratory, 9700 South Cass Avenue, Lemont, IL 60439-4873. Instrument: POLAR Vertical Double Crystal Monochromator. Manufacturer: Strumenti Scientific CINEL, S.R.L., Italy.

Intended Use: The instrument will be used as a monochromator for the Polar beamline at the Advanced Photon Source upgrade. The Polar beamline makes use of polarized synchrotron radiation to investigate magnetic properties of materials using a variety of spectroscopic and scattering methods. Materials investigated are scientific samples especially grown to answer specific scientific questions and to study basic magnetic and electric material properties. The device will be used exclusively for scientific research for a minimum of 5 years at Argonne National Laboratory. The objective is to further the understanding of material properties and to be able to tailor material properties to achieve specific magnetic and electron behavior.

Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: July 12, 2021.

Docket Number: 21-006. Applicant: Rutgers, The State University, 65 Davidson Road, Piscataway, NJ 00854. Instrument: SIPAT Crystal Grower JGD-500-1 System.

Manufacturer: Sipat Co., Ltd., Canada. Intended Use: The instruments will only be used for the study and basic understanding of the physical properties of oxide and/or metallic materials, various physical phenomena based on strongly correlated materials such as high temperature superconductors, Topological insulators, or Multiferroics. The growth of new materials will be conducted which have unique electric and magnetic properties using purchased crystal grower. To identify grown materials, we will employ x-ray diffraction and Laue. The high-quality crystals will be further investigated with a physical property measurement system and Magnetic property measurement system to obtain its electric and magnetic properties in varying conditions of temperature, electric and magnetic fields. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: July 22, 2021.

Docket Number: 21 -007. Applicant: Oregon State University, 100 Wiegand Hall, 3051 SW Campus Way, Corvallis, OR 97331. Instrument: Radio Frequency Heating System.

Manufacturer: FOSHAN JIYAN HIGH FREQUENCY EQUIP CO., LTD., China. Intended Use: The instrument will be used for studying the phenomena of radio frequency (FR) drying of food materials and understanding the effectiveness in comparison with conventional hot-air drying method. The objectives to be studied: (a) to investigate drying efficiency of radio frequency at

various operation conditions and compare with conventional hot-air drying to reduce drying time/cost and improve product quality, (b) to evaluate radio frequency heating for other application in food processing, such as pasteurization, deshelling and roasting of nuts, and drying food processing byproducts. Analytical techniques will be used to obtain quantitative data from the experiments and analyzed statistically to draw valuable conclusions.

Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: March 10, 2021.

Docket Number: 21-008. Applicant: University of North Dakota, 266 Upson Hall II, 243 Centennial Drive, Grand Forks, ND 58202-8359. Instrument: Laser metal deposition system. Manufacturer: InssTek, South Korea. Intended Use: Materials to be used are elemental pure metal powders or alloyed metal powders, the research goal will be in-situ alloying of multiple different types of elemental powders (up to six) in the laser melting pool. The primary interest of materials is Inconel 625 alloy, which will be built using the in-situ alloying of commercially pure elemental powders, they are Cr, Mo, Nb, Fe, and Ni powders, and have the diameter ranging from 45 um to 150 um. After material is prepared, the energy-dispersive X-ray spectroscopy (EDS) will be used to analyze the chemical composition and elemental distribution, and the electron backscatter diffraction (EBSD) will be applied to observe the crystal orientation and grain structure. The objective is to broaden the material availability for AM and to explore its full potential. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: July 8, 2021.

Docket Number: 21-009. Applicant: Yale University, BCT326, 15 Prospect Street, New Haven,

CT 06511. Instrument: 1.25W@4K G-M Cryocooler. Manufacturer: CSIC PRIDE (NANJING) CRYOGENIC TECHNOLOGY CO., China. Intended Use: The instrument will be used to research on superconducting films synthesized in our lab. These phenomena can only be brought to life when cooled to cryogenic temperatures created with liquid helium. The transition temperature ( $T_c$ ) and magnetic susceptibility of our superconductor samples from the resistive normal state to the zero-resistance superconducting states will be measured. The instrument would slowly cool the sample to low temperature ( $4\text{ K} = -269^\circ\text{C}$ ) and measure its resistance and magnetic susceptibility at the same time to find the transition temperature  $T_c$ . This cryocooler will help to cool our sample from room temperature to 4 K, which is  $269^\circ\text{C}$  below the freezing point in a controlled way. The cooling power required here is essential to ensure that we can reach and maintain at 4 K temperature. The small formfactor and vacuum-compatible design is also required for compatibility reasons. Justification for Duty-Free Entry: According to the applicant, there are no instruments of the same general category manufactured in the United States. Application accepted by Commissioner of Customs: July 8, 2021.

Dated: September 22, 2021.

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